USER'S MANUAL

PCI Express RS-422/485 Communication Board

English Version

Third Edition, December 2011

SUNIX Co., Ltd.

Tel : +886-2-8913-1987

Fax: +886-2-8913-1986

Http://www.sunix.com.tw

info@sunix.com.tw

PCI Express RS-422/485 Communication Board

User's Manual

Copyright

Copyright© 2010 SUNIX Co., Ltd. All Rights Reserved.

No part of this publication may be reproduced, transcribed, stored in a retrieval system, translated into any language, or transmitted in any from or by any means, photocopying, manual, or otherwise, without prior written permission from SUNIX.

Disclaimer

SUNIX shall not be liable for any incidental or consequential damages resulting from the performance or use of this equipment.

SUNIX makes no representations or warranties regarding the contents of this manual. Information in this manual has been carefully checked for reliability; however, no guarantee is given as to the correctness of this content. In the interest of continued product improvement, this company reserves the right to revise the manual or include change in the specifications of the product described within it at any time without notice and without obligation to notify any person of such revision or changes. The information contained in this manual is provided for general use by the customers.

Trademarks

SUNIX is a registered trademark of SUNIX Group.

All other trademarks or registered marks in this manual belong to their respective owners.

Safety Information

1. Keep this User's Manual for future reference.
2. Always read the safety information carefully.
3. Keep this equipment away from direct sunlight, or in humid or damp places.
4. Do not place this equipment in an unstable position, or on vibrating surface before setting it up.
5. Do not use or place this equipment near magnetic fields, televisions, or radios to avoid electronic interface that affects device performance.

Table of Contents

Chapter 1 Introduction....4

Overview....5

Package Checklist....5

Product Features....6

Product Specifications....7

Chapter 2 Hardware Installation....8

Hardware Installation....9

Pin Assignment....10

Jumper Settings....15

Chapter 3 Driver Installation....17

Windows Driver Installation....18

Windows Driver Uninstallation....23

Linux Driver Installation....24

Verify Installation....26

Chapter 4 Port Configuration....27

Configure Serial Port Settings....28

COM Port Number Settings....29

COM I/O Resource....29

FIFO Settings.... 30

Advanced Settings for RS-422/485 Communication.... 31

Chapter 5 Appendix 35

Troubleshooting....36

Product Family....38

Contact Information....43

WHQL Certification Approval

The Designed for Microsoft Windows 32/64-bit operation system WHQL logo identifies products that meet Microsoft's quality standards, SUNIX I/O products carry with this logo and listed on Windows Catalog. WHQL logo includes below operation system version

Microsoft Windows Client: Windows 2000 / XP / Vista / 7 (X86/X64)
Microsoft Windows Server: Windows 2003 / 2008 (X86/X64)

1.
Introduction

RS-422/485 Golden I/O series, a line of PCI Express Multi-port Serial Communication Board, is designed to meet PCI Express Base Specification Ver1.1 (Compliable with PCI Express General 2 Specification). Its can be installed in virtually any available PC system and compatible with all major operating systems. Users do not need to manually set jumpers to configure I/O addresses and IRQ locations.

This board offers independent RS-422 and RS-485 ports for connecting kinds of serial terminals on the PC based systems. This board is industrial stand which offers a reliable and high performance solution for serial multi-port communications.

The following topics covered in this chapter:

- **Overview**
- **Package Checklist**
- **Product Features**
- **Product Specifications**

Overview

Thanks for purchasing SUNIX PCI Express Multi-Port Communication Board; it is compatible with RS-422 and RS-485 standard serial interfaces. User can expand Multi RS-422/485 ports on PC-based system by installing in PCI Express x1, x2, x4, x8 and x16 lane slots. Each port has on-chip hardware and software flow control, a built-in 128-byte Tx/Rx FIFO, and WHQL certificated device drivers. This board is designed with SUNIX 16C950 UART controller and as well built with many of SUNIX advanced features and technologies, making it the best solution for commercial and industrial automation applications.

Package Checklist

Please check if the following items are present and in good condition upon opening your package. Contact your vendor if any item is damaged or missing.

1. Hardware:
   Serial Communication Board:
   PCI Express RS-422/485 Multi-Port Communication Board × 1

   Cable: (Depend on what product you bought)

   * 4 ports PCI Express series: DB44M to 4 ports DB9 Male Cable × 1

   * 8 ports PCI Express series: DB44M to 8 ports DB9 Male Cable × 1

   * 16 ports PCI Express series: DB78M to 16 ports DB9 Male Cable × 1

2. CD Driver
3. User's Manual (This document)
4. Termination Resistor Jumper

Product Features

- Expands Multi RS-422/485 serial ports on the system
- High performance SUNIX 16C950 compatible UART controller on-board.
- Ultra low power consumption design for Green Environment.
- Designed to meet PCI Express Base Specification Revision 1.1
- Supports x1, x2, x4, x8, x16 (lane) PCI Express Bus connector keys.
- Data transmission speeds up to 921.6Kbps.
- On-chip hardware auto flow control to guarantee no data loss.
- RS-422 and RS-485 auto detect and switching technology.
- AHDC/CS™ technology for collision free communication.
- Built-in ± 15KV ESD protection for all serial signals.
- 2.0 KV optical isolation protection for all signal and power. ***(SI Version Only)***
- 500W peak surge protection for all signal lines. ***(SI Version Only)***
- Plug-n-Play, I/O address and IRQ assigned by BIOS.
- Certified by CE, FCC, RoHS, and Microsoft WHQL approval.
- Support Microsoft Windows, Linux, and DOS.

Note:

SUNIX RS-422/485 Card with ***Surge*** and ***Isolation*** (**SI** Version) is available with certain models which include TVSS (Transient Voltage Surge Suppressor) technology to help prevent damage due to lightning or high potential voltage. Optical isolation (2000V) and embedded protection (max. ESD of 16 KV, max. EFT of 2 KV). These features help provide protection in critical or harsh factory-type environments.

Product Specifications

Serial Communication

Interface	RS-422/485	**Baud rate**	50bps ~921.6Kpbs
Controller	SUNIX SUN1999 (16C950 UART Compatible)	**Stop bit**	1, 1.5, 2
BUS	PCI Express one lane (x1)	**Parity**	even, odd, none, mark, space
No. of Port	1/2/4/8/16-port	**Flow Control**	None, Xon/Xoff, RTS/CTS
IRQ & IO	Assigned by System	**FIFO**	128byte Hardware
Signal	RS-422: TxD+, TxD-, RxD+, RxD-, GND 4-wire RS-485: TxD+, TxD-, RxD+, RxD-, GND 2-wire RS-485: Data+, Data-, GND		
ESD Protection	±15KV ESD protection for each signal Human Body Model (HBM) ±15KV IEC1000-4-2 Air Gap Discharge ±8KV IEC1000-4-2 Contact Discharge		
Surge Protection	500W peak surge protection for all signal lines meet IEC 61000-4-5 **(SI Version Only)**		
Isolation Protection	2.5 KV Isolation Protection for all signal and power **(SI Version Only)**		
Connector	DB9 / 25 Male		

Driver Support

Microsoft Client	XP / Vista / 7 (X86/X64)
Microsoft Server	2000 / 2003 / 2008 (X86/X64)
Microsoft Embedded	XP Embedded / POS Ready 2009 / Embedded System 2009
Linux	Linux 2.4.x / 2.6.x
DOS	DOS

Regulatory Approvals

Hardware	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B, RoHS
Software	Microsoft WHQL Windows Microsoft Client: XP / Vista / 7 (X86/X64) Microsoft Server: 2000 / 2003 / 2008 (X86/X64)

Environment

Operation Temperature	0 to 60˚C (32 to 140˚F)
Operation Humidity	5 to 95% RH
Storage Temperature	-20 to 85˚C (-4 to 185˚F)

2.
Hardware Installation

This chapter includes information about hardware installation for PCI Express RS-422/485 Multi-Port Communication Board. The following topics are covered:

- **Hardware Installation**
- **Pin Assignments**
- **Jumper Settings**

Hardware Installation

The hardware installation of PCI Express serial boards is easy to carry out. Before inserting the card into the PCI Express bus, please follow the detailed steps given below to install the PCI Express serial board in your computer.

Safety First

To avoid damaging your system and boards, make sure your PC's power is turned off before installing PCI Express card.

Step 1: Turn your PC's power off, and shut off the power to any peripheral.

Step 2: Remove the power plug from the plug socket.

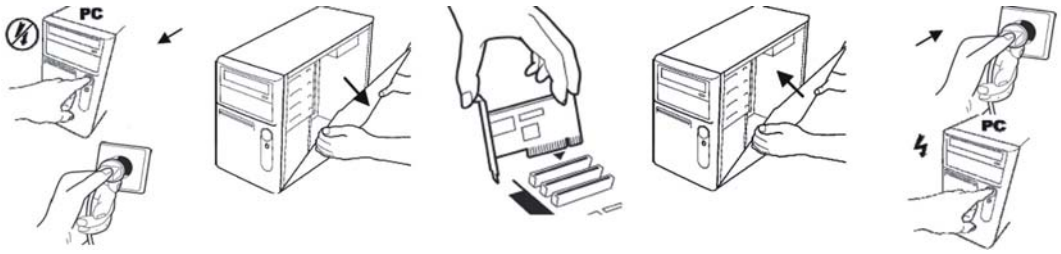
Step 3: Remove the cover from the computer case.

Step 4: If fitted. Remove the metal cover plate on the rear of a free PCI-E slot.

Step 5: Insert PCI Express Multi-Port Communication Board into the free PCI Express slot and screw it firmly on the bracket side.

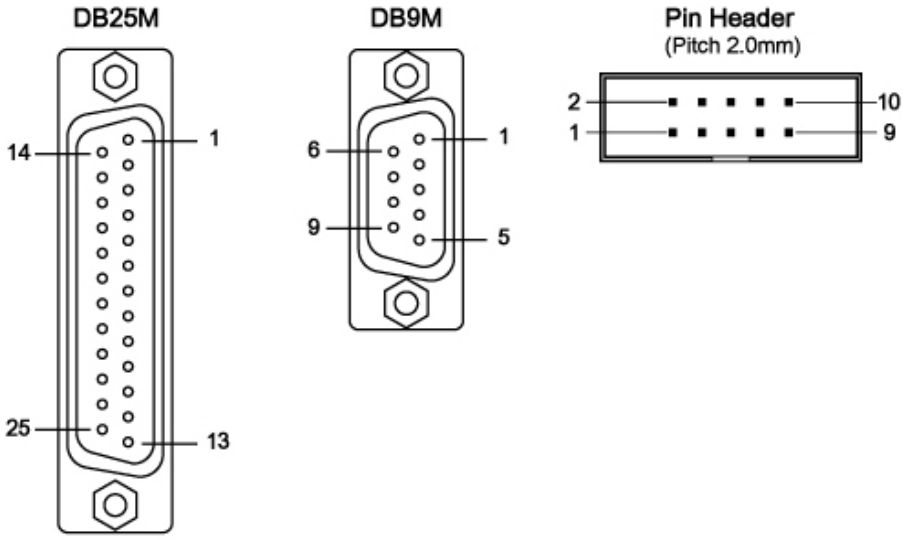
Step 6: Place the cover back onto the computer.

Step 7: Insert the plug into the plug socket.



Pin Assignment

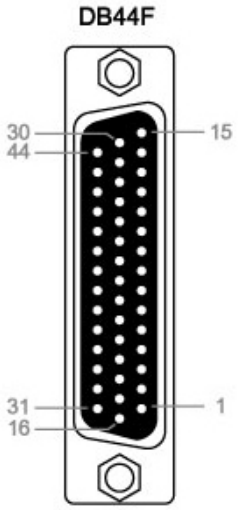
This chapter provides the pin assignments for SUNIX PCI Express RS-422/485 Multi-Port Communication Board, as well as the pin assignments for the optional accessories.

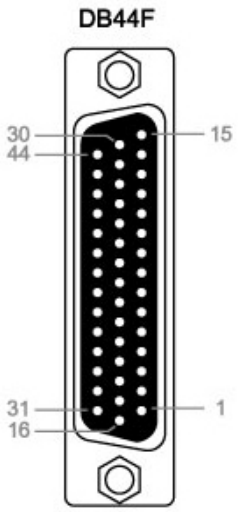


RS-422 or 4-Wire RS-485			
PIN	DB9M	DB25M	Pin Header
Tx+	2	3	3
Tx-	1	8	1
Rx+	3	2	5
Rx-	4	20	7
GND	5	7	9

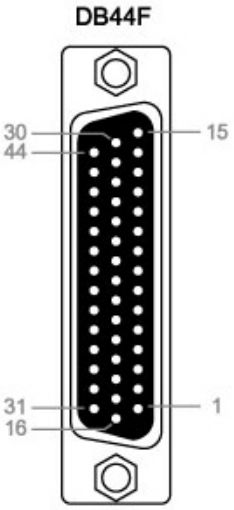
2-Wire RS-485			
PIN	DB9M	DB25M	Pin Header
Tx+	2	3	3
Tx-	1	8	1
GND	5	7	9

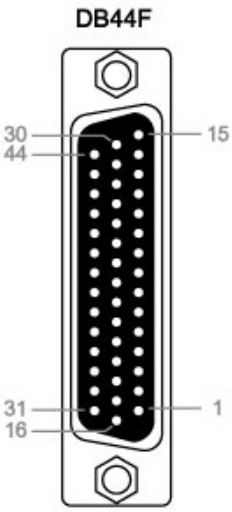
SUNIX 4-port RS-422/485 Card builds DB44F connector on board.

SUNIX **DB44 Female** 4 ports Serial Communication Boards Pin Assignment						
RS-422 or 4-Wire RS-485	Port / Signal	1	2	3	4	
	Tx+	32	36	40	44	
	Tx-	17	22	26	30	
	Rx+	3	7	11	15	
	Rx-	1	5	9	13	
	GND	GND	GND	GND	GND	

SUNIX **DB44 Female** 4 ports Serial Communication Boards Pin Assignment						
2-Wire RS-485	Port / Signal	1	2	3	4	
	D+	32	36	40	44	
	D-	17	22	26	30	
	GND	GND	GND	GND	GND	

SUNIX 8-port RS-422/485 Card builds DB44F connector on board.

SUNIX **DB44** Female 8 ports Serial Communication Boards Pin Assignment										
	Port / Signal	1	2	3	4	5	6	7	8	
RS-422 or **4-Wire RS-485**	Tx+	32	2	36	6	40	10	44	14	
	Tx-	17	18	22	34	26	38	30	42	
	Rx+	3	31	7	35	11	39	15	43	
	Rx-	1	16	5	20	9	24	13	28	
	GND	GND	GND	GND	GND	GND	GND	GND	GND	

SUNIX **DB44** Female 8 ports Serial Communication Boards Pin Assignment										
	Port / Signal	1	2	3	4	5	6	7	8	
2-Wire RS-485	Tx+	32	2	36	6	40	10	44	14	
	Tx-	17	18	22	34	26	38	30	42	
	GND	GND	GND	GND	GND	GND	GND	GND	GND	

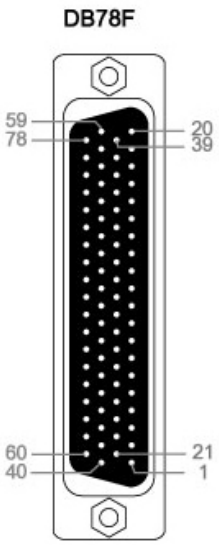
SUNIX 16-port RS-422/485 Card builds DB78F connector on board.

SUNIX **DB78 Female** 16 ports Serial Communication Boards Pin Assignment

RS-422
or
4-Wire
RS-485

Port / Signal	1	2	3	4	5	6	7	8
Tx+	60	21	43	4	65	26	48	9
Tx-	40	1	62	23	45	6	67	28
Rx+	61	22	44	5	66	27	49	10
Rx-	41	2	63	24	46	7	68	29
GND	GND	GND	GND	GND	GND	GND	GND	GND

Port / Signal	9	10	11	12	13	14	15	16
Tx+	70	31	53	14	75	36	58	19
Tx-	50	11	72	33	55	16	77	38
Rx+	71	32	54	15	76	37	59	20
Rx-	51	12	73	34	56	17	78	39
GND	GND	GND	GND	GND	GND	GND	GND	GND

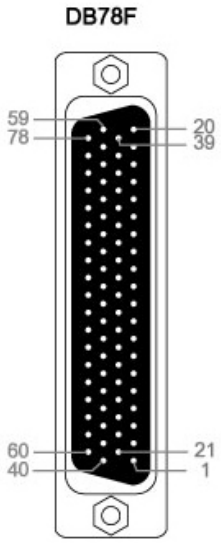


SUNIX **DB78 Female** 16 ports Serial Communication Boards Pin Assignment

2-Wire RS-485

Signal \ Port	1	2	3	4	5	6	7	8
Tx+	60	21	43	4	65	26	48	9
Tx-	40	1	62	23	45	6	67	28
GND	GND	GND	GND	GND	GND	GND	GND	GND

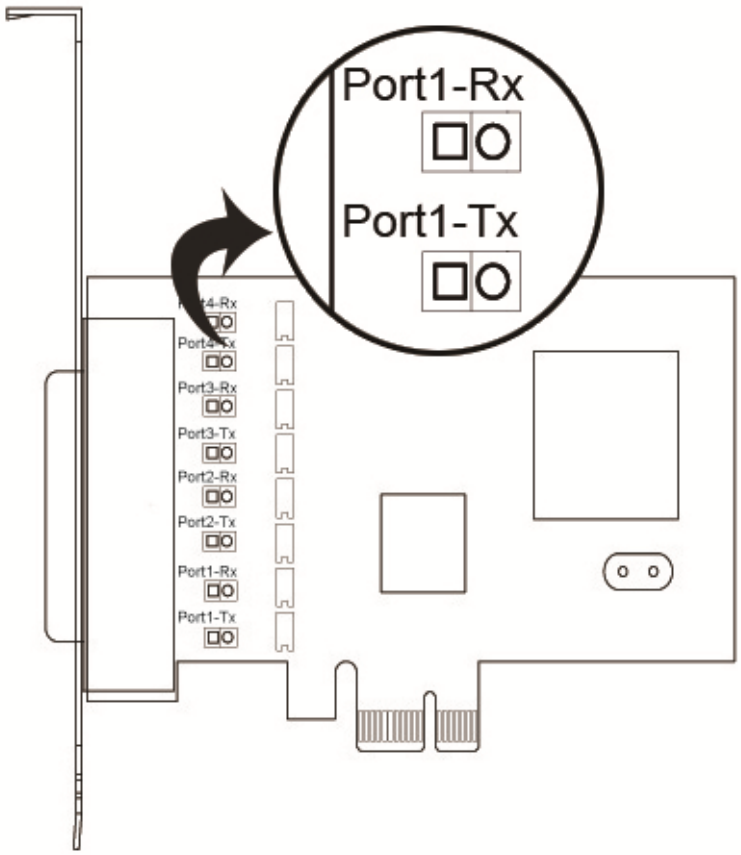
Signal \ Port	9	10	11	12	13	14	15	16
Tx+	70	31	53	14	75	36	58	19
Tx-	50	11	72	33	55	16	77	38
GND	GND	GND	GND	GND	GND	GND	GND	GND



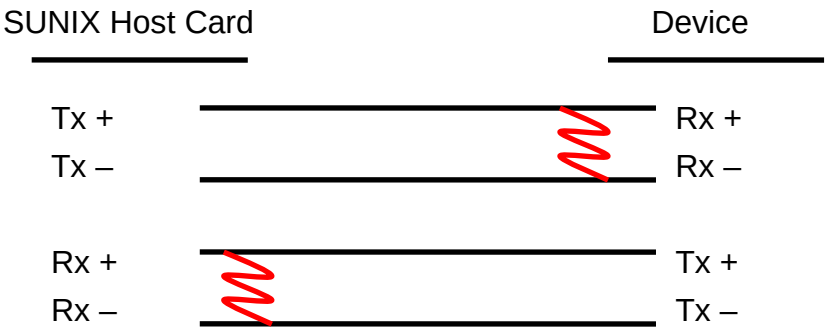
Jumper Settings

For RS-422/485 serial communications, when an electrical signal travels through two different resistance junctions in a transmission line, the impedance mismatch will sometimes cause signal reflection. Signal reflection causes signal distortion, which in turn will contribute communication errors. The solution to this problem is to establish the same impedance at the line ends as in the line itself by terminating them with resistors.

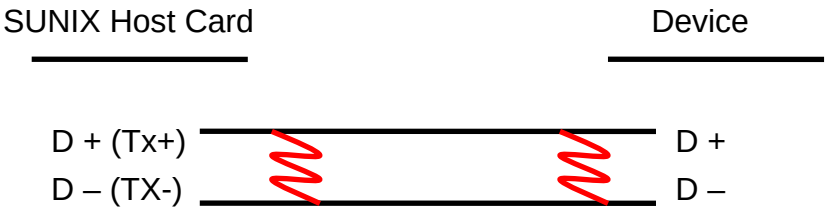
Ideally, the two ends of the cable will have a termination resistor connected across the two wires. Without termination resistors, reflections of fast driver edges can cause multiple data edges that can cause data corruption. Termination resistors also reduce electrical noise sensitivity due to the lower impedance, and bias resistors (120 ohms for twisted pairs) are required. The value of each termination resistor should be equal to the cable impedance.



RS-422 or 4-Wire RS-485 working model with termination resistor:



2-Wire RS-485 working model with termination resistor:



SUNIX RS-422/485 PCI Express Serial board equips independent TX and RX termination resistors for each serial port. User can modify the jumper setting (short the pins) to avoid impedance mismatched problem when operate under Multi-drop transmission. Resistors should be added near the receiving side. Note: Stands for termination resistor near the receiving side.

Manufactory default jumper setting is OPEN (disable 120 ohms termination resistors across the two wires).

3.
Driver Installation

After installing the PCI Express RS-422/485 Multi-Port Communication Board in your system successfully, please follow the step by step software installation guide to confirm how to install appropriate driver and configure the serial port settings.

The driver for PCI Express serial board supports Windows and Linux operating systems, and you can select your requirement in the following chapter:

The following topics covered in this chapter:

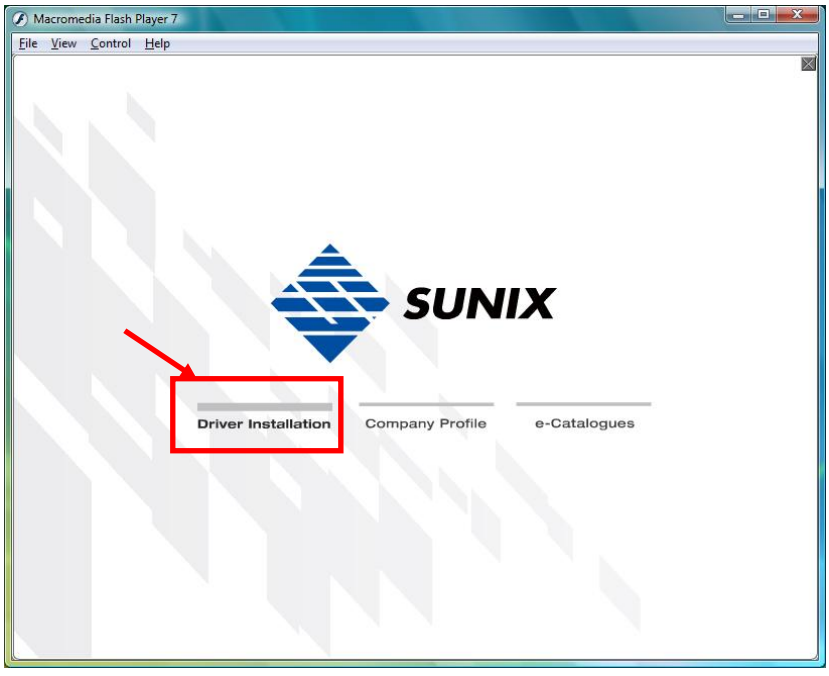
- **Windows Driver Installation**
- **Windows Driver Uninstallation**
- **Linux Driver Installation**
- **Verify Installation**

Windows Driver Installation

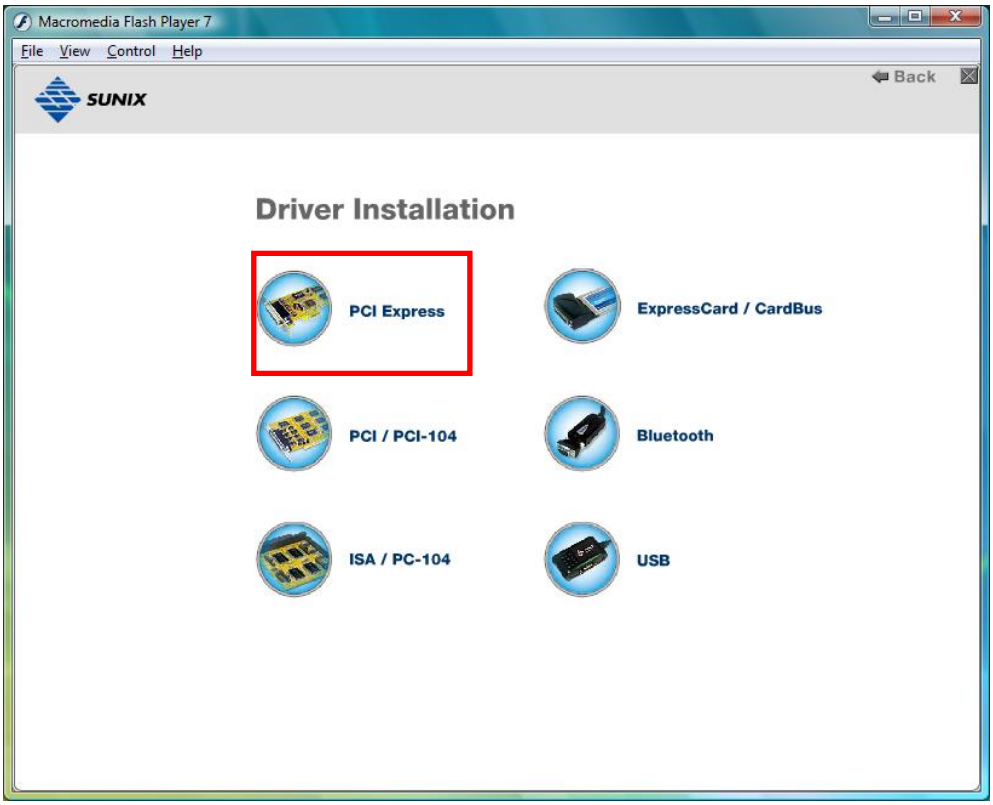
Please refer to following instructions to install the driver for the first time under Windows operation system. You will need to plug the board in an available PCI Express slot first, before installing the driver.

(1) After the board is physically installed and the PC boots up, system will detect the PCI Express Serial card and prompt for driver installation wizard, please choose cancel.

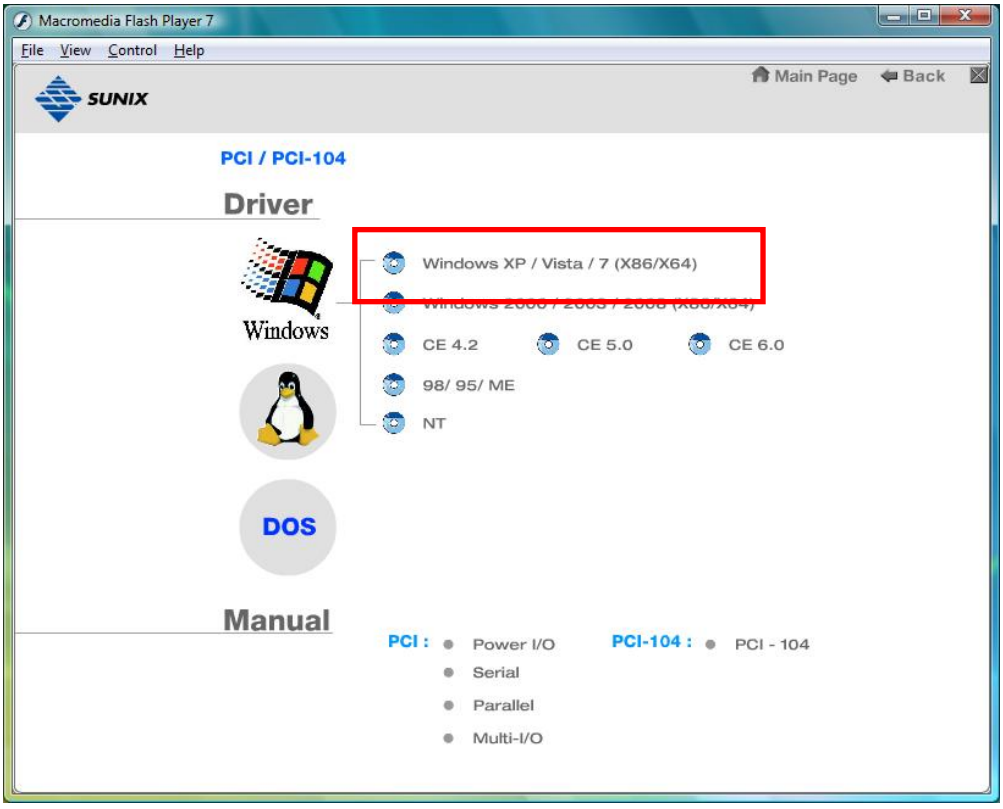
(2) Put CD driver bound with product in your CD / DVD ROM drive.
Please select autorun.exe., then select "**Driver Installation**".



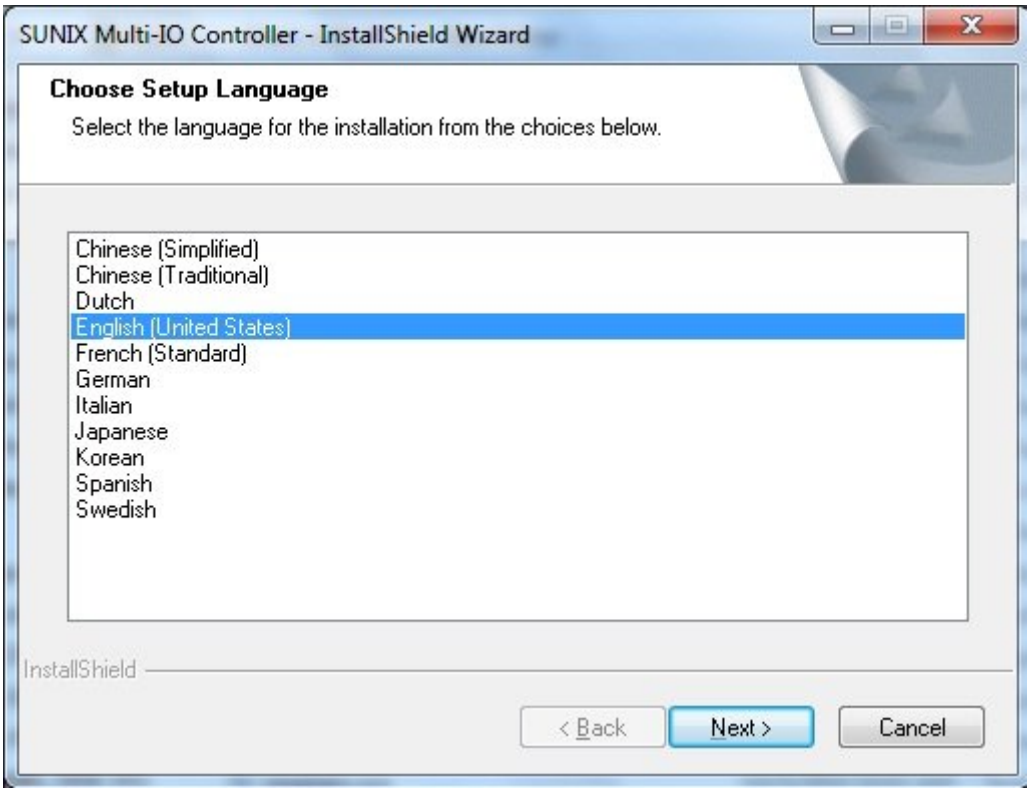
(3) Please select the product interface you bought, such as PCI Express.



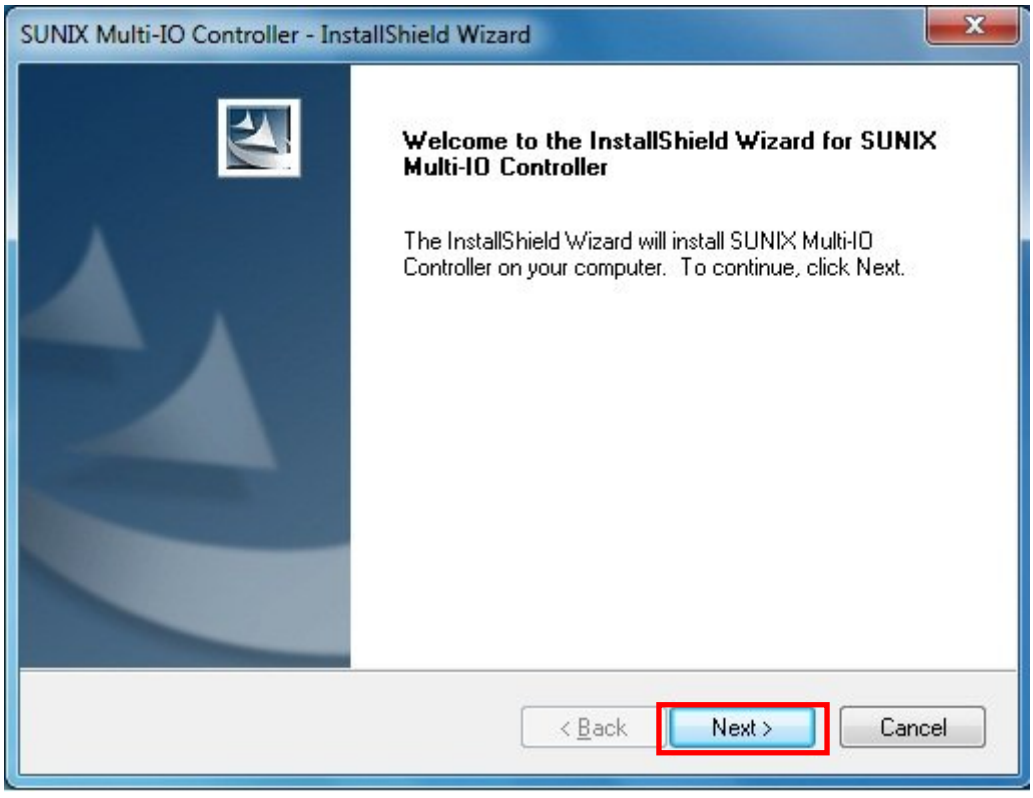
(4) Please select the O.S. version you are using, such as Windows Vista. Then system will process the driver installation step automatically.



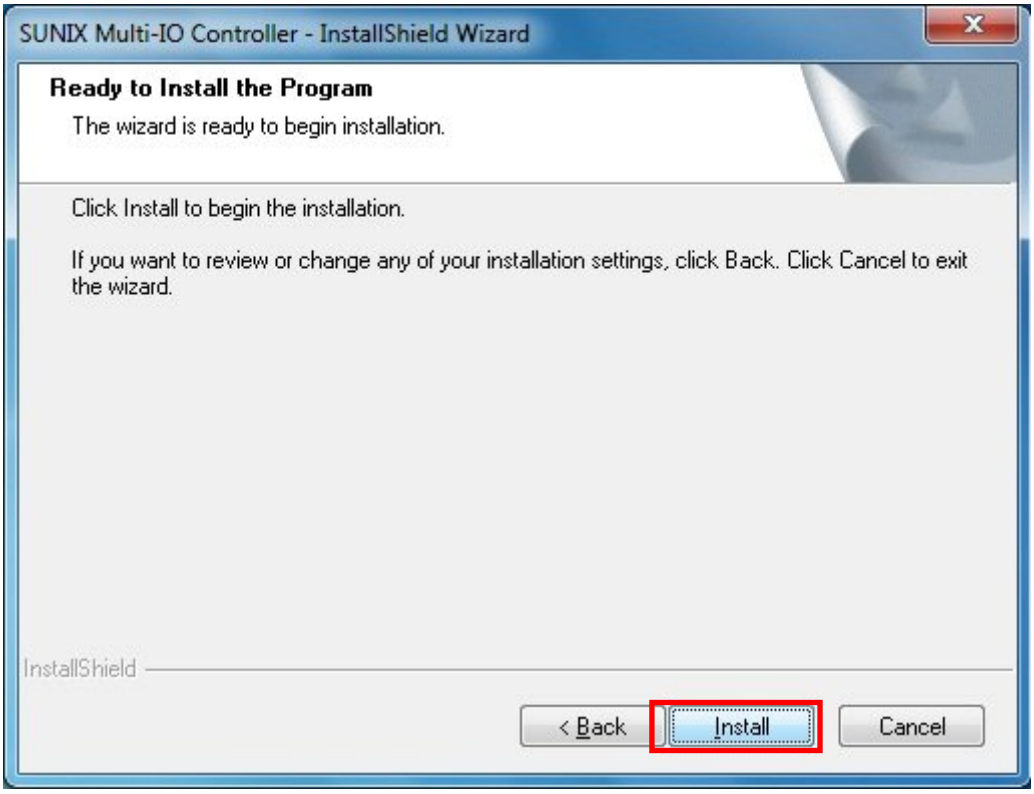
(5) Please select driver language for your operation system.



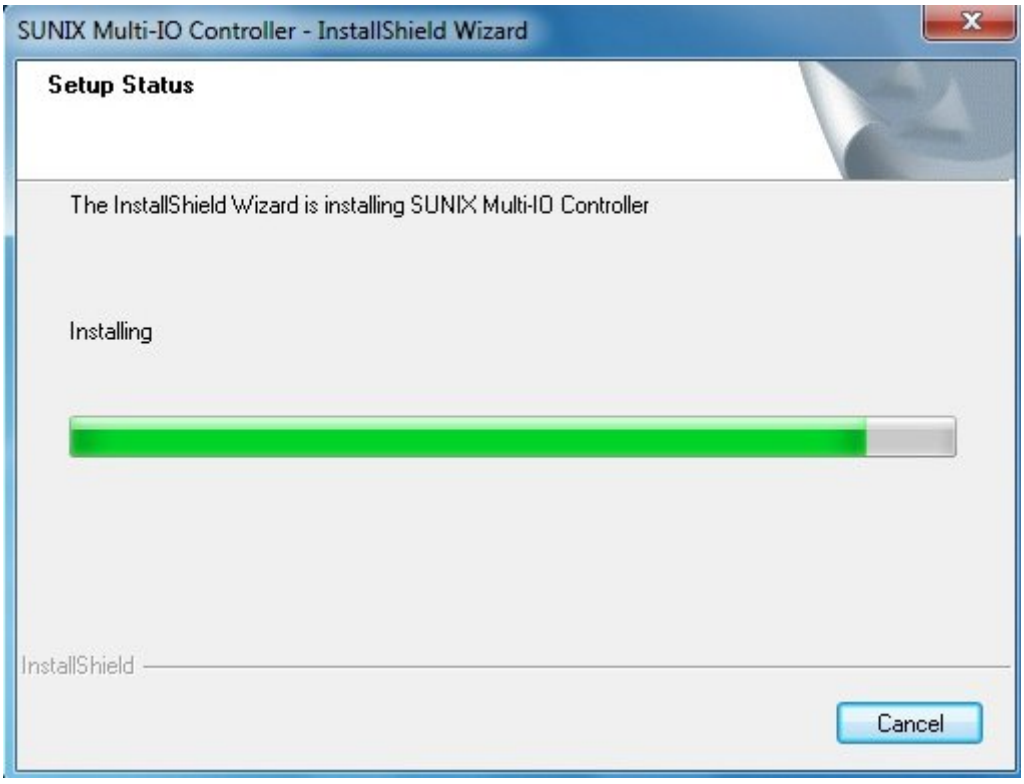
(6) Click "**Next**" to continue driver installation steps.


SUNIX Multi-IO Controller - InstallShield Wizard
Welcome to the InstallShield Wizard for SUNIX Multi-IO Controller
The InstallShield Wizard will install SUNIX Multi-IO Controller on your computer. To continue, click Next.
< Back
Next >
Cancel

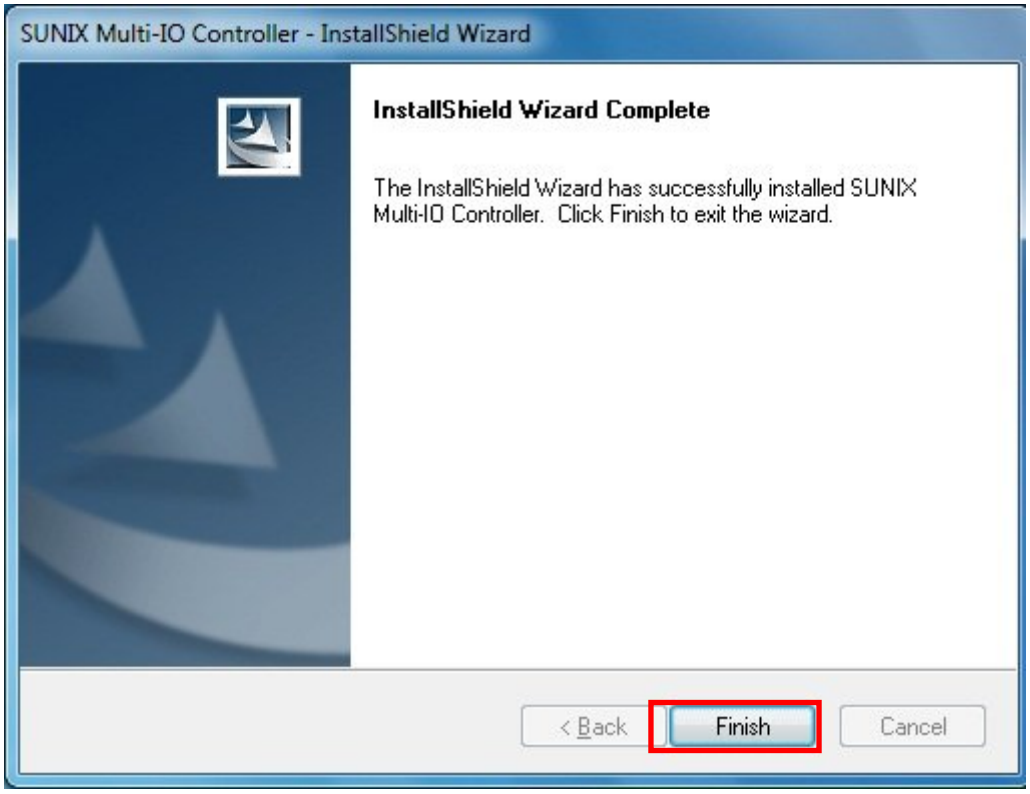
(7) Click “**Install**” to continue driver installation steps.


SUNIX Multi-IO Controller - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

(8) System will install driver automatically. It takes about one minute.



(9) Click “**Finish**” to end installation steps.

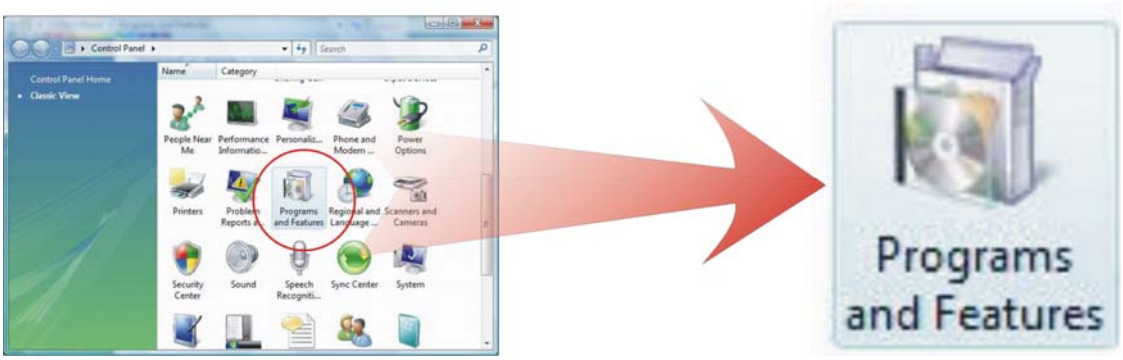

SUNIX Multi-IO Controller - InstallShield Wizard
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed SUNIX Multi-IO Controller. Click Finish to exit the wizard.
< Back
Finish
Cancel

Windows Driver Uninstallation

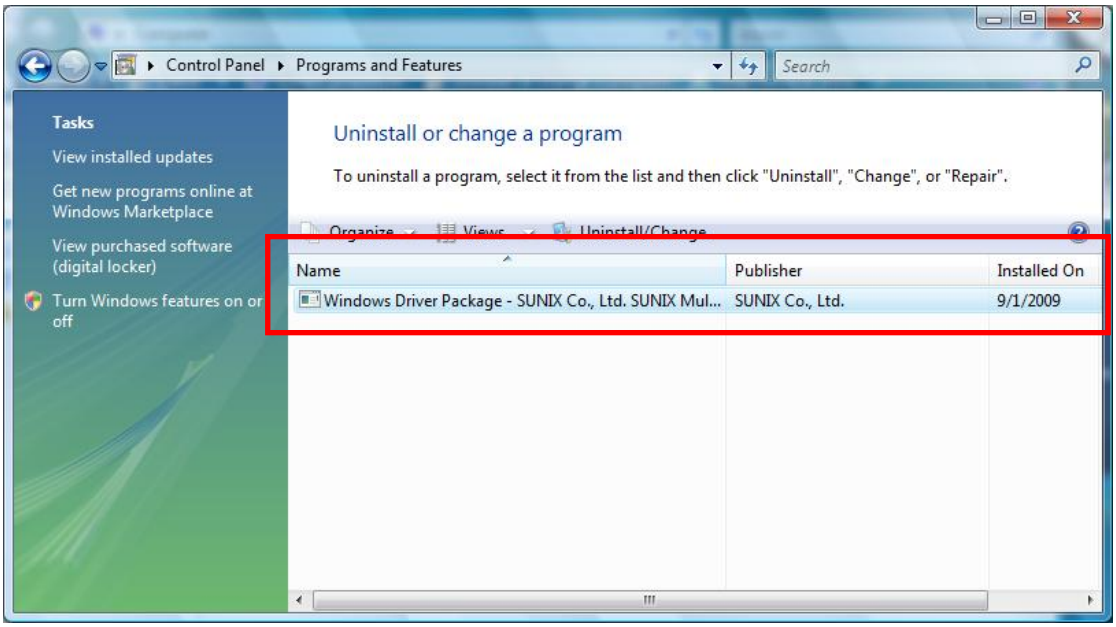
Please refer to following instructions uninstall Multi-I/O card driver.

(1) Click on the "**Programs and Features**" tab in the Windows Control Panel.

Start > Controller Panel > Programs and Features



(2) Entry Uninstall or change a program page, and double click "**Windows Driver Package – SUNIX Co., Ltd SUNIX Multi-I/O Controller**" to process driver uninstallation procedure.



Linux Driver Installation

This installation guide describes the procedures to install the PCI Express serial board in Linux kernel 2.4.x and 2.6.x. Please refer to “snx_Vx.x.x.x.tar.gz” for driver installation detail in CD Driver (Linux folder) directory.

: \ PCI_IO \ Linux

(1) Driver install

Please create a directory under root directory, e.g /temp, do commands:

```
# cd /
# mkdir temp
```

After get driver file "snx_Vx.x.x.x.tar.gz". Copy file to /temp directory, then extract and install, do commands:

```
# cp snx_Vx.x.x.x.tar.gz /temp
# cd /temp
# tar xvfz snx_Vx.x.x.x.tar.gz
# cd /temp/snx
# make clean ; make install

************************************************************
* If system is Suse 9.0 and errors occur when
* "make clean ; make install", do commands:
*
* # cd /usr/src/linux/
* # make cloneconfig
* # make dep
*
* then do "make clean ; make install" again in /temp/snx
************************************************************
```

Load driver module, do command:

```
# modprobe snx
```

or

insmod /temp/snx/driver/snx.ko (snx.o for kernel 2.4)

Check driver module, do command:
lsmod | grep snx

Unload driver, do command:
rmmod snx

(2) Device node creation

Each serial port has one device node which is named "ttySNX?", maximum up to 32 serial ports.

Each parallel port has two device node which is name "lp?" and "parport?". This step will backup lp2~lp3 and parport2~parport3 to lp?.bak and parport?.bak in /dev for your system first. Then, create lp2~lp3 and parport2~parport3 in /dev for sunix driver, maximum up tp 2 parallel ports.

This setp will be done when do "make clean ; make install", if device nodes aren't in /dev, do commands:

cd /temp/snx/snxmknod
./snxmknod

This will create device nodes in /dev.

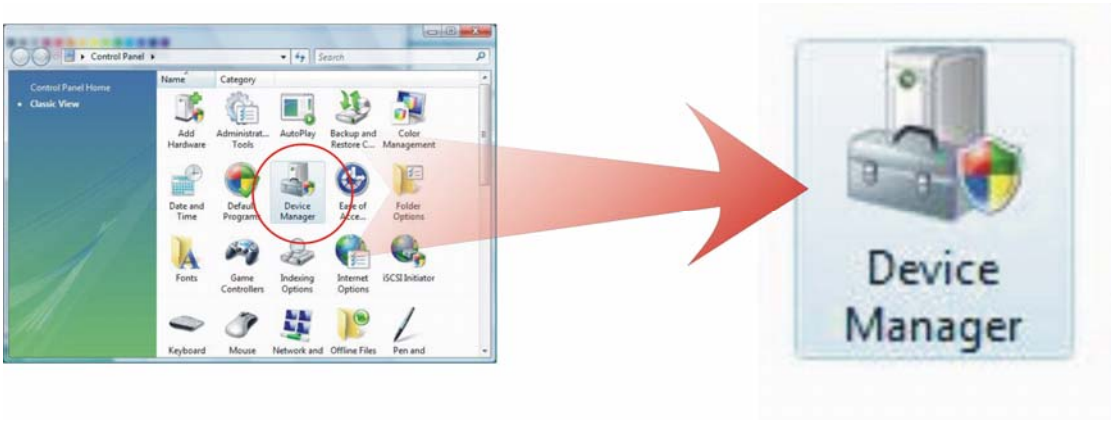
If there are more than two boards installed, serial port device nameing convention please refer to F1.

Verify Installation

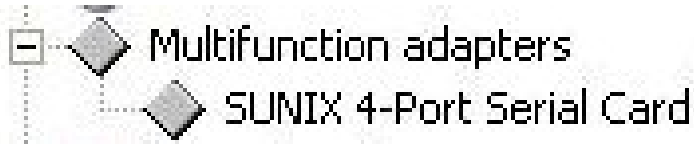
You can use Windows "**Device Manager**" to verify proper installation.

(1) Click on the "**Programs and Features**" tab in the Windows Control Panel.

Start > Controller Panel > Device Manager



(2) In the Device Manager window, you should see this board under **Multifunction adapters** (4-port RS-422/485 Serial Card in this example). You should also see SUNIX COM port under **Ports (COM & LPT)**.



4.
Port Configuration

This chapter shows all Serial COM port settings that user came with usually, such as COM port number, FIFO length(size), baud rate, IO address and others.

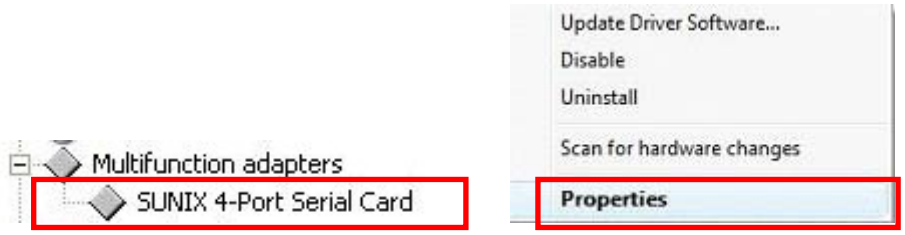
The following topics covered in this chapter:

- **Configure Serial Port Settings**
- **COM Port Number Settings**
- **COM I/O Resource**
- **FIFO Settings**
- **Advanced Settings for RS-422/485 Communication**

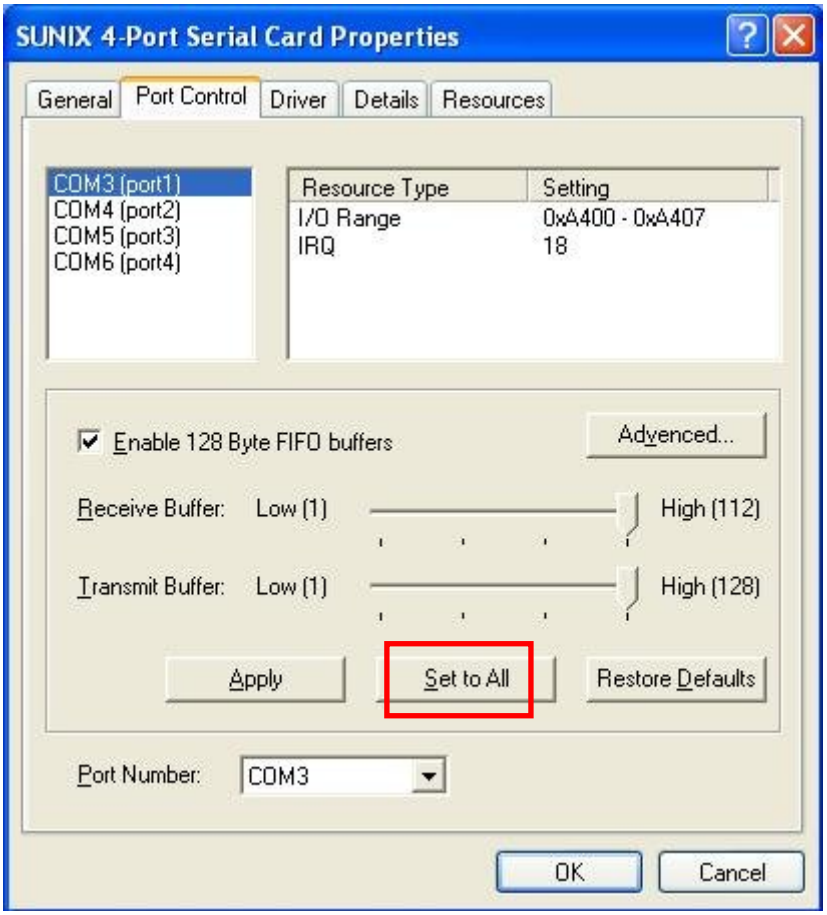
Configure Serial Port Settings

After the board and serial port drivers are installed, please refer to following instructions to configure Serial COM settings.

(1) Please launch the "**Device Manager**".
(2) Right click the "**SUNIX Serial Card**" item from the "**Multifunction adapters**" sub-tree and click "**Properties**".

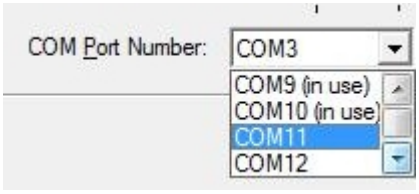


(3) On the "**Port Control**" tab, select a port to configure.
* Click "**OK**" to approve the settings for the selected port.
* Click "**Set to All**" to approve the settings for all COM ports.



COM Port Number Settings

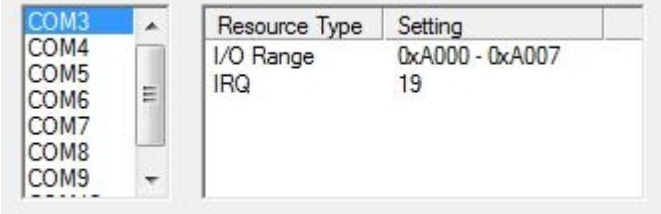
Under Port Number, select a COM number to assign to the serial port. Click "**OK**" to approve the settings for the selected port.



Note: In order to prevent system resource conflict, do not select "**in use**" port.

COM I/O Resource

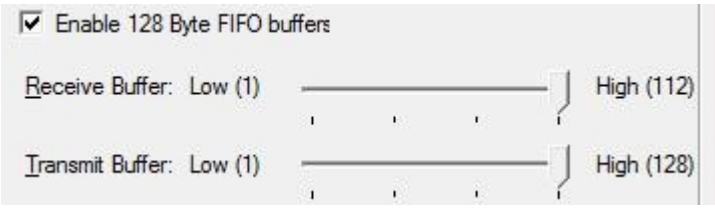
User can read the COM "**IO Range**" and "**IRQ**" located in system by selecting COM port.



IRQ and I/O address is automatically assigned by the mainboard PCI (PCI Express) BIOS automatically (before COM card driver installing). User can NOT assign legacy ISA address (3F8, 3E8, 2F8, 2E8) for the specific COM port. But for IRQ setting, user can set specific IRQ value for this PCI Express bus slot via mainboard's BIOS settings (not via SUNIX driver). But all COM ports will share one IRQ value.

FIFO Settings

Select an Rx FIFO Trigger and Tx FIFO Size.
The default Rx FIFO Trigger is 112 bytes. The default Tx FIFO Size is 128 bytes. Click "**Set to All**" to change this setting for all serial ports on the board. Then click "**OK**" to save the settings.



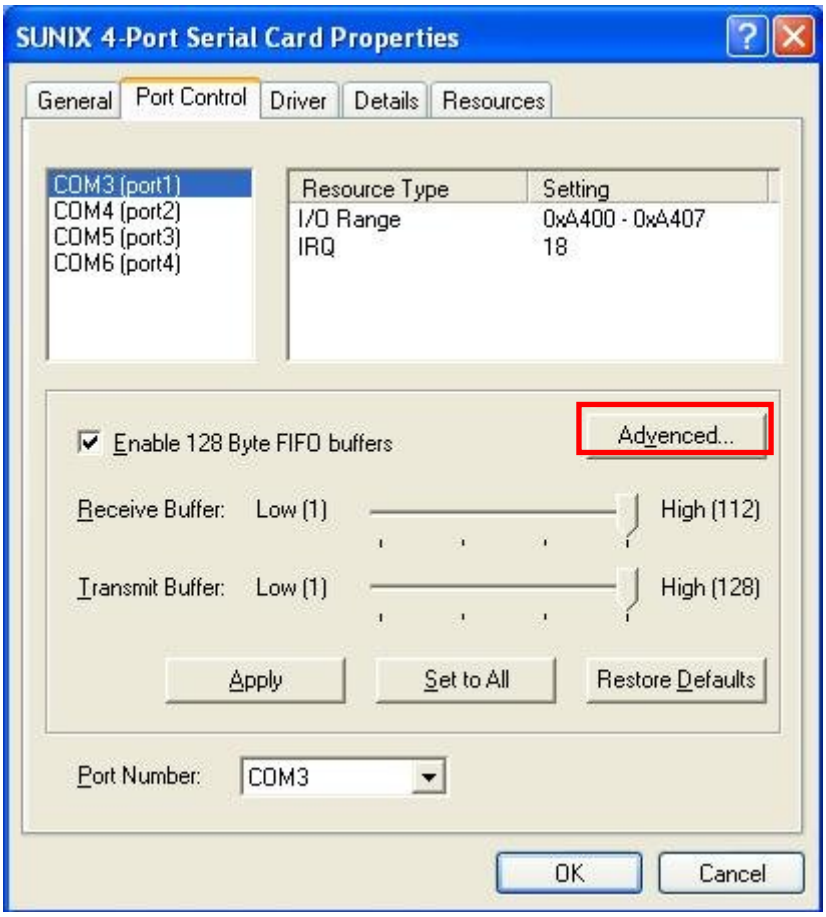
Receive FIFO interrupt trigger level:
When the level of data in the receiver FIFO reaches this value, a receiver data interrupt is triggered.

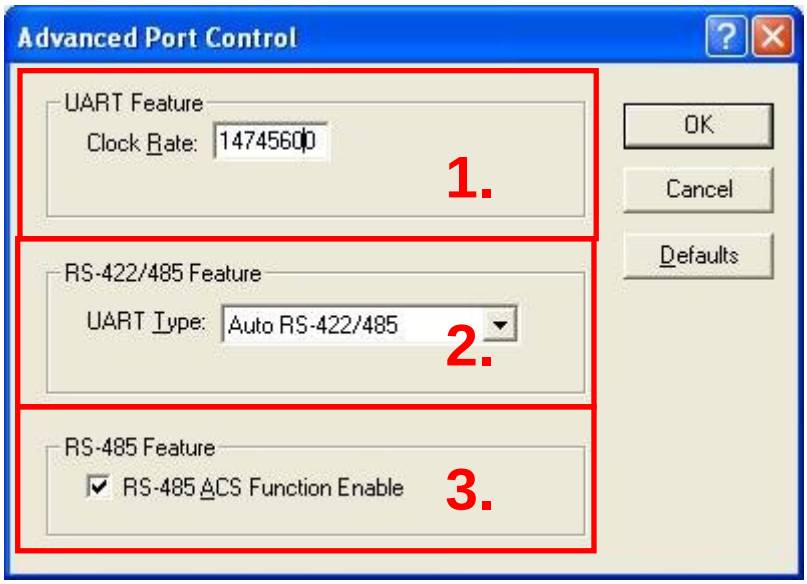
Transmit FIFO interrupt trigger level:
When the level of data in the transmit FIFO falls below this value, a transmitter interrupt is triggered. Setting this value to zero will not trigger an interrupt until the transmitter is completely idle.

The FIFO trigger levels can be fine tuned to gain optimum performance, depending on system performance, baud rate used, levels of serial traffic etc.

Advanced Settings for RS-422/485 Communication

User can control RS-422/485 communication in Advanced Port Control page through “**Advanced**” settings.

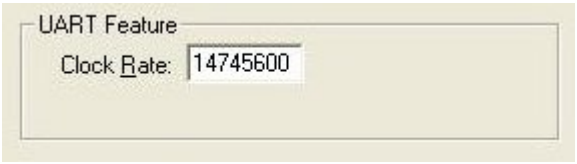




Clock Rate

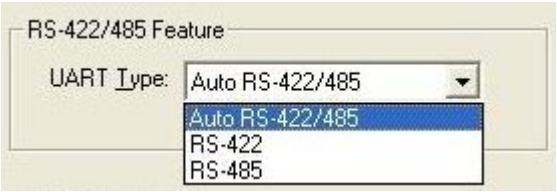
This is the “Data Rate" value for on board crystal frequency of input clock. The baud rate can optionally be adjusted according to the data rate required. The clock pre-divisor is used to divide the input clock prior to baud rate generation.

This parameter must matches with the oscillator (crystal) frequency on the board. System default is **14745600 Hz**. We do NOT recommend for modification without SUNIX instruction. User can click “**Defaults**” button back to manufactory settings.



UART Type (Default: Auto RS-422/485)

User can select RS-422 or RS-485 interface for each COM port of this board.



1). Auto RS-422/485

SUNIX developed a unique technology “ Auto Detect & Switching RS-422/485, which can automatically detect the state of RS-422 full duplex or RS-485 half duplex and control the data transmitting and receiving wires at the same port without any hardware or software settings.

2). RS-422 (4-Wire RS-485)

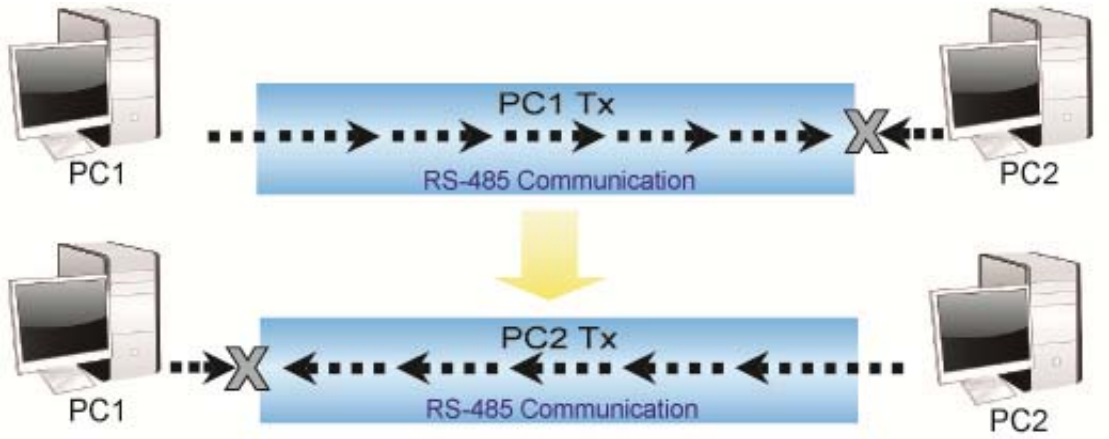
This COM port forces to run RS-422 full duplex mode.
(RS-485 ACS function can not open under this mode.)

3). RS-485

This COM port forces to run RS-485 half duplex mode.

RS-485 ACS™ Technology (Default: Enable)

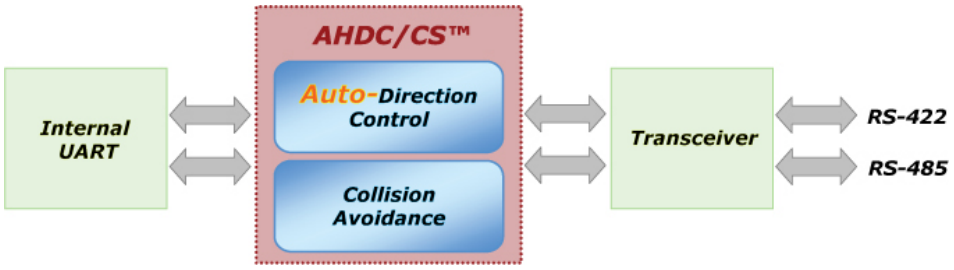
Auto Carrier Sense (ACS™) technology is the data flow control under RS-485 half duplex (one-way traffic) communicating. It manages data flow between computers or devices or between nodes in a RS-485 network, so that the data can be handled at an efficient pace



Auto Carrier Sense (ACS™) technology will check the status of RS-485 communication bus. If the bus is idle, it starts transmission. If the bus is not idle (some data flows in the bus), then it will postpone the transmission of UART until the bus is idle. Due to the reduction of TX/RX packet conflicting on RS-485 one-way traffic bus, it will enhance better system performance and RS-485 communication ability.

RS-485 AHDC™ Technology

Since RS-485 is bidirectional which means the driver is turned on only when it needs to transmit some data, otherwise it is floating. SUNIX developed a new design to control the direction of driver (On or off) automatically which is called Auto Hardware Direction Control/Carrier Sense. AHDC/CS™ works on the same principle and only turns on the driver when UART needs to transmits some data; but the advantage is that AHDC/CS™.



Auto Hardware Direction Control (AHDC™) technology makes it easier to manage 2-wire RS-485 half-duplex communications, eliminating the need for software interference. User does not necessary to write extra code for Windows applications to control the half-duplex protocol. Auto Hardware Direction Control (AHDC™) technology is the key feature of SUNIX UART, and this function is default enabling.

5.
Appendix

This chapter shows some problems that user came with usually. Also you can check it if the PCI Express serial board can not work properly in your system after following hardware and software installation steps. In addition, you could contact with us for detail technical product information.

In this appendix, we cover the following topics.

- **Troubleshooting**
- **Product Family**
- **Contact Information**

Troubleshooting

1. System fails to find the PCI Express serial board or COM port.

A: It may cause by following issue:

a. The board is not properly plugged into the PCI Express slot.

b. Please clean the golden finger.

c. The PCI Express slot is defective. Please try other slots until you find one that works.

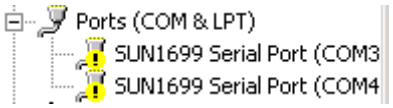
d. The mainboard does not have an available IRQ for the PCI Express serial board. Enter the PC.s BIOS and make sure an IRQ setting is available in the PCI/PnP settings.

e. The board itself might be defective. You can try another mainboard testing this board working or not.

2. There is a blue screen when I entry operation system.

A: The possible reason is an IRQ or I/O address conflict with other PCI Express or PCI bus adapters, such as LAN or serial boards, or with the system BIOS. Refer to the corresponding problem in the previous FAQ for solutions.

3. There are some exclamation marks in device manager and serial ports can not work properly.



A: It caused by the wrong driver installing or hardware settings. Please turn off your computer firtly and re-install hardware and software, especially re-install the correct driver.

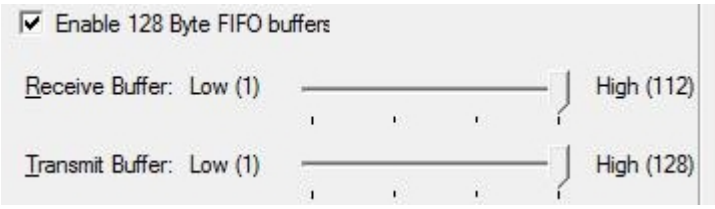
4. Should I enable auto flow control features?

A: Enable Auto CTS/RTS Flow Control means the CTS/RTS flow control is controlled by hardware automatically. System will be more stable if the function is enabled. Please make sure your serial device and cable wiring before enabling the hardware flow control function.

5. How large FIFO length I should set?

A: FIFO (First-in-First-out) buffers are used to reduce the frequency of interrupt processes for UART chips. The size of the buffer will determines the number of times the cards need to interrupt the computer's CPU in order to process a string of data. With larger FIFO buffer size; there is more data flow and less interruption to the CPU, therefore allowing the CPU to be free to handle other more crucial tasks.

Set the Receive/Transmit Buffer to higher value will get faster performance because the interrupts will be reduced, but the time for interrupt service routine will become shorter. The receive buffer overflow will be easily happened if the CPU speed is not enough to handle. If the system is not stable, select the lower value to correct problems.



Product Family

SUNIX provides kinds of RS-232/422/485 interface cards for customer selection, including PCI Express, PCI, PCI/104, CardBus, and ExpressCard. Please refer to the product family table for reference.

RS-422/485 PCI Express Interface

Port	Connecter	Baud Rate	ESD Protection	Surge Protection	Isolation Protection	Model NO.
8	DB44 Female	921.6Kbps	±15KV	600W	2.5KV	IPC-E2108SI
				-	-	IPC-E2108
4	DB44 Female	921.6Kbps	±15KV	600W	2.5KV	IPC-E2104SI
				-	-	IPC-E2104
2	DB9 Male	921.6Kbps	±15KV	600W	2.5KV	IPC-E2102SI
				-	-	IPC-E2102

RS-422/485 PCI Interface

Port	Connecter	Baud Rate	ESD Protection	Surge Protection	Isolation Protection	Model NO.
16	DB79 Female	921.6Kbps	±15KV	-	-	IPC-P2116
8	DB44 Female	921.6Kbps	±15KV	600W	2.5KV	IPC-P2108SI
				-	-	IPC-P2108
4	DB44 Female	921.6Kbps	±15KV	600W	2.5KV	IPC-P2104SI
				-	-	IPC-P2104
2	DB9 Male	921.6Kbps	±15KV	600W	2.5KV	IPC-P2102SI
				-	-	IPC-P2102

RS-422/485 PCI/104 Interface

Port	Connecter	Baud Rate	ESD Protection	Surge Protection	Isolation Protection	Model NO.
8	5x2 Pin Header	921.6Kbps	±15KV	600W	2.5KV	IPC-B2108SI
				-	-	IPC-B2108
4	5x2 Pin Header	921.6Kbps	±15KV	600W	2.5KV	IPC-B2104SI
				-	-	IPC-B2104
2	5x2 Pin Header	921.6Kbps	±15KV	600W	2.5KV	IPC-B2102SI
				-	-	IPC-B2102

RS-232/422/485 PCI Express Interface						
Port	**Connecter**	**Baud Rate**	**ESD Protection**	**Surge Protection**	**Isolation Protection**	**Model NO.**
8	DB44 Female	921.6Kbps	±15KV	600W	2.5KV	IPC-E3108SI
				-	-	IPC-E3108
4	DB44 Female	921.6Kbps	±15KV	600W	2.5KV	IPC-E3104SI
				-	-	IPC-E3104

RS-232/422/485 PCI Interface						
Port	**Connecter**	**Baud Rate**	**ESD Protection**	**Surge Protection**	**Isolation Protection**	**Model NO.**
8	DB44 Female	921.6Kbps	±15KV	600W	2.5KV	IPC-P3108SI
				-	-	IPC-P3108
4	DB44 Female	921.6Kbps	±15KV	600W	2.5KV	IPC-P3104SI
				-	-	IPC-P3104

RS-232 PCI Express Interface						
Port	**Connecter**	**Baud Rate**	**ESD Protection**	**Power output**	**Bracket**	**Model NO.**
16	Mini SCSI 68 Female	921.6Kbps	±15KV	-	Standard	SER1640A
8	DB62 Female	115.2 kbps		-	Standard	SER5466A
				-	Low profile	SER5466AL
	Mini SCSI 68 Female	921.6Kbps		-	Standard	SER5466H
				-	Low profile	SER5466HL
4	DB44 Female	115.2 kbps		-	Standard	SER5456A
				5V/12V		SER5456P
				-	Low profile	SER5456AL
				5V/12V		SER5456PL
		921.6Kbps		-	Standard	SER5456H
				5V/12V		SER5456PH
				-	Low profile	SER5456HL
				5V/12V		SER5456PHL
2	DB9 Male	115.2 kbps		-	Standard	SER5437A
				5V/12V		SER5437P
	DB44 Female			-	Low profile	SER5437AL
				5V/12V		SER5437PL
	DB9 Male	921.6Kbps		-	Standard	SER5437H
				5V/12V		SER5437PH
	DB44 Female			-	Low profile	SER5437HL
				5V/12V		SER5437PHL
	5x2 Pin Header			-		SER5037UHL

RS-232 PCI Interface

Port	Connecter	Baud Rate	ESD Protection	Power output	Bracket	Model NO.
8	Mini SCSI 68	921.6Kbps	±15KV	-	Standard	SER1600A
	DB62 Female	115.2Kbps	±2KV	-	Standard	SER5066A
	Mini SCSI 68			-	Low profile	SER5066AL
	5x2 Pin Header				Standard	SER5066U
				-	Low profile	SER5066UL
	DB62 Female	921.6Kbps	±15KV	-	Standard	SER5066H
	Mini SCSI 68			-	Low profile	SER5066HL
	5x2 Pin Header			-	Standard	SER5066UH
				-	Low profile	SER5066UHL
4	DB44 Female	115.2Kbps	±2KV	-	Standard	SER5056A
				5V/12V		SER5056P
				-	Low profile	SER5056AL
				5V/12V		SER5056PL
	5x2 Pin Header			-	Standard	SER5056U
				-	Low profile	SER5056UL
	DB44 Female	921.6Kbps	±15KV	-	Standard	SER5056H
				-	Low profile	SER5056HL
				5V/12V	Standard	SER5056PH
	5x2 Pin Header			-		SER5056UH
				-	Low profile	SER5056UHL
	DB44 Female			5V/12V		SER5056PHL
2	DB9 Male	115.2Kbps	±2KV	-	Standard	SER5037A
				5V/12V		SER5037P
	5x2 Pin Header			-		SER5037U
	DB44 Female			-	Low profile	SER5037AL
				5V/12V		SER5037PL
	5x2 Pin Header			-		SER5037UL
	DB9 Male	921.6Kbps	±15KV	-	Standard	SER5037H
				5V/12V		SER5037PH
	5x2 Pin Header			-		SER5037UH
	DB44 Female			-	Low profile	SER5037HL
				5V/12V		SER5037PHL
	5x2 Pin Header			-		SER5037UHL
1	DB9 Male	115.2Kbps	±2KV	-	Standard	SER5027A
				5V/12V		SER5027P
				-	Low profile	SER5027AL
				5V/12V		SER5027PL
		921.6Kbps	±15KV	-	Standard	SER5027H
				5V/12V		SER5027PH
				-	Low profile	SER5027HL
				5V/12V		SER5027PHL

RS-232 ExpressCard Interface					
Port	**Connecter**	**Baud Rate**	**ESD Protection**	**Bracket**	**Model NO.**
4	DB44 Female	921.6Kbps	±15KV	34mm	ECS4000
2				34mm	ECS2000
1	DB9 Male			34mm	ECS1000

RS-232 CardBus Interface					
Port	**Connecter**	**Baud Rate**	**ESD Protection**	**Bracket**	**Model NO.**
4	DB44 Female	115.2Kbps	±15KV	54mm	CBS4000
2				54mm	CBS2000
1	DB9 Male			54mm	CBS1000

RS-232 PCI/104 Interface				
Port	**Connecter**	**Baud Rate**	**ESD Protection**	**Model NO.**
8	5x2 Pin Header	115.2Kbps	±2KV	SER5337A
4				SER5356A
2				SER5366A

Contact Information

Customer satisfaction is our number one concern, and to ensure that customers receive the full benefit of our products, SUNIX services has been set up to provide technical support, driver updates, product information, and user's manual updates.

The following services are provided

E-mail for technical support

..... info@sunix.com.tw

World Wide Web (WWW) Site for product information:

.....http://www.sunix.com.tw

This page is blank